

What is claimed is:

1. A perpendicular magnetic recording medium in which an underlayer for leading perpendicular orientation of a perpendicular magnetic recording layer is stacked between a substrate and the perpendicular magnetic recording layer,

5 wherein the thickness of the perpendicular magnetic recording layer is controlled within the range of 5-40 nm to have a negative nucleation field.

10 2. The perpendicular magnetic recording medium as claimed in claim 1, wherein the perpendicular magnetic recording layer contains 8-20 atomic % Pt.

15 3. The perpendicular magnetic recording medium as claimed in claim 1, wherein the perpendicular magnetic recording layer contains 11-20 atomic % Pt.

4. The perpendicular magnetic recording medium as claimed in claim 1, wherein the perpendicular magnetic recording layer contains 11-18 atomic % Pt.

5. The perpendicular magnetic recording medium as claimed in claim 1, wherein the perpendicular magnetic recording layer contains 12-20 atomic % Cr.

20 6. The perpendicular magnetic recording medium as claimed in claim 1, wherein the perpendicular magnetic recording layer contains 14-17 atomic % Cr.

7. The perpendicular magnetic recording medium as claimed in claim 1, wherein the perpendicular magnetic recording layer is formed of Co-Cr-Pt-alloy.

25 8. The perpendicular magnetic recording medium as claimed in claim 7, wherein the perpendicular magnetic recording layer contains 8-20 atomic % Pt.

9. The perpendicular magnetic recording medium as claimed in claim 7, 30 wherein the perpendicular magnetic recording layer contains 11-20 atomic % Pt.

10. The perpendicular magnetic recording medium as claimed in claim 7,

wherein the perpendicular magnetic recording layer contains 11-18 atomic % Pt.

11. The perpendicular magnetic recording medium as claimed in claim 7,
wherein the perpendicular magnetic recording layer contains 12-20 atomic % Cr.

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12. The perpendicular magnetic recording medium as claimed in claim 7,
wherein the perpendicular magnetic recording layer contains 14-17 atomic % Cr.

10 13. The perpendicular magnetic recording medium as claimed in claim 7,
wherein the perpendicular magnetic recording layer is formed of Co-Cr-Pt-alloy
containing 8-20 atomic % Pt and 12-20 atomic % Cr.

14. The perpendicular magnetic recording medium as claimed in claim 7,
wherein the perpendicular magnetic recording layer further comprises Ta, Nb, or
Ta+Nb in an amount of less than 4 atomic %.

15. The perpendicular magnetic recording medium as claimed in claim 7,
wherein the perpendicular magnetic recording layer further comprises Ta, Nb, or
Ta+Nb in an amount of less than 2-4 atomic %.

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16. The perpendicular magnetic recording medium as claimed in claim 1,
wherein the under layer is formed of Ti-alloy.